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WHAT IS CLAIMED IS:

1. A system comprising:

a decoder to receive a video input having one or more motion vectors, the decoder to provide decoded video and first motion vectors associated with the video input stream;

a first memory coupled to the video decoder to store the first motion vectors; and

a scaler coupled to the decoder to receive the decoded video and to provide a scaled video;

an encoder coupled to the scaler and the first memory to provide a compressed representation of the scaled video using the first motion vectors saved in the first memory.

2. The system of claim 1 further comprising:

a second memory coupled to the video decoder to store a representation of the decoded video.

3. The system of claim 2, wherein the representation of the decoded video is the decoded video.

4. The system of claim 2, wherein the scaler is a down-scaler.

5. The system of claim 2, wherein the scaler is an up-scaler.

6. The system of claim 1, wherein the video encoder has a vector generation portion that provides second motion vectors based on the first motion vectors saved in the first memory.

7. The system of claim 6, wherein a specific vector of the second motion vectors is based on a plurality of vectors of the first motion vectors.

8. The system of claim 6, wherein a specific vector of the second motion vectors is based on an average of at least two vectors of the first motion vectors.

9. The system of claim 6, wherein a specific vector of the second motion vectors is based on a most frequently occurring vector of the first motion vectors.

10. The system of claim 6, wherein the video input is an MPEG data input stream.

11. A method comprising the steps of:

determining a plurality of first motion vectors associated with a compressed first video image;

storing the plurality of first motion vectors (a stored plurality of first motion vectors);

generating one or moresecond motion vectors based on the stored plurality of first motion vectors; and

generating a compressed second video image based upon one or moresecond motion vectors, wherein the second video image is a scaled representation of the first video image.

12. The method of claim 11 further comprising the step of:

storing a representation of the first video image after the step of determining; and

wherein the step of generating a compressed second video image includes generating the compressed second video image based on the one or more second motion vectors and a second video image, wherein the second video image is a representation of the first video image.

13. The method of claim 12, wherein the scaled representation is a scaled-down representation.

14. The method of claim 12, wherein the scaled representation is a scaled-up representation.

15. The method of claim 12, wherein the step of generating the one or more second motion vectors includes averaging at least a portion of the plurality of first motion vectors to represent a vector in the one or more second motion vectors.

16. The method of claim 12, wherein the step of generating the one or more second motion vectors includes selecting a most frequently occurring vector in a portion the plurality of first motion vectors to represent a vector in the one or more second motion vectors.

17. The method of claim 11, wherein the step of generating the one or more second motion vectors includes averaging at least a portion of the plurality of first motion vectors to represent a vector in the one or more second motion vectors.

18. The method of claim 11, wherein the step of generating the one or more second motion vectors includes selecting a most frequently occurring vector in a portion of the plurality of first motion vectors to represent a vector in one or more of second motion vectors.

19. The method of claim 11, wherein a number of vectors in the one or more second motion vectors that represents the second video image is different than a number of vectors in the plurality of first motion vectors that represent the first video image, and wherein the second video image is a representation of the first video image.

20. The method of claim 19, wherein the number of vectors in the one or more second motion vectors is less than the number of vectors in the plurality of first motion vectors.

21. The method of claim 19, wherein the number of vectors in the one or more second motion vectors is greater than the number of vectors in the plurality of first motion vectors.

22. A video processing device comprising:

a video input to receive a compressed video input stream utilizing motion vectors;

a downscaling and decompression module responsive to the video input, the downscaling and decompression module to perform compressed video decoding of the compressed video input stream;

a memory buffer, the memory buffer responsive to the downscaling and decompression module;

a video encoder, the video encoder responsive to the downscaling and decompression module and responsive to the memory buffer; and

wherein the memory buffer stores motion vectors retrieved by the downscaling and decompression module when processing the compressed video input stream to produce a downscaled and decompressed video stream and wherein the encoder retrieves the motion vectors from the memory buffer in connection with encoding the downscaled and decompressed video stream.

23. The video processing device of claim 22, further comprising a second memory buffer responsive to the downscaling and decompression module, the second memory buffer to store video data frames provided by the downscaling and decompression module.

24. The video processing device of claim 23, wherein the video encoder is responsive to the second memory buffer.

25. The video processing device of claim 24, further comprising an output buffer, the output buffer responsive to the video encoder.

26. The video processing device of claim 22, wherein a set of motion vectors is determined based upon the motion vectors from the memory buffer and wherein the video encoder uses the set of motion vectors to encode the downscaled and decompressed video stream.

27. The video processing device of claim 26, wherein the set of motion vectors is determined by performing an averaging operation on motion vectors retrieved from the memory buffer.

28. The video processing device of claim 26, wherein the set of motion vectors is determined by performing a voting operation with respect to motion vectors from the memory buffer.

29. The video processing device of claim 28, wherein the voting operation identifies the most frequently occurring motion vector.

30. The video processing device of claim 29, wherein the voting operation also includes a tie breaking function, and wherein the tie breaking function uses a random method to select among the candidate motion vectors.

31. The video processing device of claim 29, wherein the voting operation also includes a tie breaking function, and wherein the tie breaking function uses a predetermined pattern of choices to select among candidate motion vectors.

32. The video processing device of claim 31, wherein a control input is used to set integer values of s and t, where t is an integer greater than one, and where s is an integer greater than zero but less than t, and where a resulting image represented by the downscaled and decompressed video stream is s/t of the size of the image represented by the compressed video input stream.

33. A method of processing video data, the method comprising:
receiving a compressed video input stream;
downscaling and decompressing the compressed video input stream to produce a downscaled and decompressed video stream;
determining a set of motion vectors associated with the compressed video input stream in connection with the step of downscaling and decompressing;
storing the set of motion vectors in a memory;
retrieving the set of motion vectors from the memory; and
using the set of motion vectors retrieved from the memory in connection with encoding the downscaled and decompressed video stream.

34. The method of claim 33, further comprising storing video data frames provided by the downscaling and decompression module into a second memory.

35. The method of claim 34, further comprising using data video frames retrieved from the second memory in connection with encoding the downscaled and decompressed video stream.

36. The method of claim 33, further comprising producing an encoded video stream and storing the encoded video stream into an output memory.

37. The method of claim 36, further comprising determining a second set of motion vectors based upon the motion vectors retrieved from the memory wherein the encoder uses the second set of motion vectors to encode the downscaled and decompressed video stream to produce the encoded video stream.

38. The method of claim 37, wherein the second set of motion vectors is determined by taking an average of motion vectors from the memory.

39. The method of claim 37, wherein the second set of motion vectors is determined by performing a voting operation with respect to motion vectors from the memory.

40. The method of claim 39, wherein the voting operation determines the most frequently occurring motion vector.

41. The method of claim 39, wherein the voting operation further includes a tie breaking function, and wherein the tie breaking function uses a random method to select among the candidate motion vectors.

42. The method of claim 39, wherein the voting operation further includes a tie breaking function, and wherein the tie breaking function uses a predetermined pattern of choices to select among candidate motion vectors.

43. The method of claim 33, wherein a control input is used to set integer values of s and t, where t is an integer greater than one, and where s is an integer greater than zero but less than t, and wherein a resulting image represented by the downscaled and decompressed video stream is s/t of the size of the image represented by the compressed video input stream.

44. A compressed video transcoder device comprising:
a compressed video input stream that utilizes frame deltas and motion vectors;
a first interface into a first external memory buffer;
a second interface into a second external memory buffer to store motion vectors;
a third interface into a third external memory buffer to store final compressed output;
a control input to set integer values of s and t, where t=2,3,… and s=1,2,…,t-1;
a downscaling decompression block that performs full compressed video decoding connected to the first external memory buffer and second external memory buffer where the resulting image is s/t the size of the original;
a compression block that performs simplified compressed video encoding connected to the first external memory buffer, the second memory buffer, and the third external memory buffer;
said downscaling decompression block storing motion vectors decoded from the input stream into the second external memory buffer; and
said compression block reading motion vectors from the second external memory buffer and writing its output into the third external memory buffer.

45. A compressed video transcoder device according to claim 44 wherein at least one of the second and third external memory buffers is the same as the first external memory buffer.

46. A compressed video transcoder device according to claim 44 wherein at least one of the second and third external memory buffers is internal to the device.

47. A compressed video transcoder device according to claim 44 wherein the compression method is based on an MPEG compression scheme utilizing frame difference with motion vectors where fragments used in connection with the MPEG compression scheme are macroblocks, where the motion vectors are of the form $[(X,Y),(\Delta X_1, \Delta Y_1)]$ or $[(X,Y),(\Delta X_1, \Delta Y_1), (\Delta X_2, \Delta Y_2)]$, and where (X,Y) denotes a current macroblock and each

44. A compressed video transcoder device comprising:

a compressed video input stream that utilizes frame deltas and motion vectors;

a first interface into a first external memory buffer;

a second interface into a second external memory buffer to store motion vectors;

a third interface into a third external memory buffer to store final compressed output;

a control input to set integer values of s and t, where t=2,3,... and s=1,2,...,t-1;

a downscaling decompression block that performs full compressed video decoding connected to the first external memory buffer and second external memory buffer where the resulting image is s/t the size of the original;

a compression block that performs simplified compressed video encoding connected to the first external memory buffer, the second memory buffer, and the third external memory buffer;

said downscaling decompression block storing motion vectors decoded from the input stream into the second external memory buffer; and

said compression block reading motion vectors from the second external memory buffer and writing its output into the third external memory buffer.

45. A compressed video transcoder device according to claim 44 wherein at least one of the second and third external memory buffers is the same as the first external memory buffer.

46. A compressed video transcoder device according to claim 44 wherein at least one of the second and third external memory buffers is internal to the device.

47. A compressed video transcoder device according to claim 44 wherein the compression method is based on an MPEG compression scheme utilizing frame difference with motion vectors where fragments used in connection with the MPEG compression scheme are macroblocks, where the motion vectors are of the form $[(X,Y),(\Delta X_1, \Delta Y_1)]$ or $[(X,Y),(\Delta X_1, \Delta Y_1), (\Delta X_2, \Delta Y_2)]$, and where (X,Y) denotes a current macroblock and each $(\Delta X_k, \Delta Y_k)$ denotes a motion vector component from reference frame k.

48. A compressed video transcoder device according to claim 47 where the fragments are any fragment other than the standard square macroblocks of MPEG, and where motion estimation is a required step of compression.

49. A compressed video transcoder device according to claim 44 wherein the motion vectors obtained by the decompression unit are stored and then later retrieved by the compression block.

50. The compression video transcoder device of claim 49, where a new set of motion vectors is built as follows, each k-th motion vector $(\Delta X_k, \Delta Y_k)_{new}$ = AVERAGE($(\Delta X_k, \Delta Y_k)_A$, $(\Delta X_k, \Delta Y_k)_B, \ldots, (\Delta X_k, \Delta Y_k)_M$), where M is greater than one.

51. A compressed video transcoder device according to 49 where in a new set of motion vectors is built as follows, each k-th frame motion vector $(\Delta X_k, \Delta Y_k)_{new}$ = VOTE($(\Delta X_k, \Delta Y_k)_A$, $(\Delta X_k, \Delta Y_k)_B, \ldots, (\Delta X_k, \Delta Y_k)_M$) and where the VOTE function retrieves the most frequently occurring vector, with any method to break ties involving an arbitrary choice or a pattern of choices among the candidate vectors.

52. A method of processing a video data stream, the method comprising:
initializing a frame encoder;
selecting a macroblock of the video data stream to be encoded;
retrieving motion vectors associated with the macroblock from memory,
building a new motion vector based on the motion vectors retrieved from memory; and
building a delta macroblock based on the new motion vector.

53. The method of claim 52, wherein the motion vectors were stored in memory during a previous video decoding process.

54. The method of claim 53, further comprising performing a discrete cosine transform for data blocks within the macroblock to produce a transformed macroblock.

55. The method of claim 54, further comprising quantizing the transformed macroblock to produce a quantized macroblock.

56. The method of claim 55, further comprising variable length encoding the quantized macroblock to produce an encoded macroblock.